

PLOW SPECIFICATIONS

1

8' Front Mounted Snow Plow (Item ID 1000176369)

Moldboard

The blade shall be 8' wide and is a full moldboard trip blade design.

Blade moldboard shall be constructed from a minimum 11 gauge steel and includes standard cast iron wear shoes.

Cutting edge shall be Kuper GK-5 rubber edge with ceramic inserts or Joma 6000

Blade shall be 29" high with 7 vertical and 2 diagonal ribs. Blade measures 83" wide when angled at 30° and 96" when in the straight position.

Blade shall have a heavy duty push frame and quadrant which 1½" X 10" hydraulic angle rams attach directly to.

The quadrant shall have built in angle ram stops. Blade shall include 4 fully adjustable trip springs and a shock absorber.

The blade and all attached parts shall have a baked-on powder coat finish with a zinc primer undercoating.

Note: Stainless steel or poly moldboard is not acceptable

Plow Attaching System

The plow shall have a hydraulically assisted attaching mechanism with an electrical toggle switch mounted on the headgear.

The connecting pin spring levers can be properly positioned and shall engage automatically when toggle switch is energized, and headgear is raised by use of the hydraulic lift cylinder and hydraulic power unit.

The system shall also have a direct mounted 2" x 1½" x 10" lift ram with no lift chain or linkage or a two chain lift system.

The truck mounted push assembly shall be height adjustable to be properly adjusted to various vehicle ride heights.

Headlamp System

The plow headlamps shall have high and low beam capability. Halogen or L.E.D. bulbs are acceptable. Front lenses with a built-in defrosting system to eliminate snow and ice build-up are required if bidding an L.E.D. bulb. System shall include cab mounted toggle switch to energize plow lights when plow is attached. Headlamp mounting mechanism shall include wraparound type hold down mount and tab style adjustment locking mechanism.

Lights meet SAE and FMVSS 108 specifications.

Electrical / Control System

PLOW SPECIFICATIONS

2

Electrical system shall have two connectors at the vehicle grille.

Control harness shall have complete compatibility to operate either straight plows or Vee plows with no modifications to harness.

Electrical power for plow shall come directly from vehicle battery and shall have no effect on other vehicle systems.

Plow control options shall include a push button type handheld control or a joystick type control.

Handheld control shall have options that include the control being mounted to dash or the handle being removed for operators' preference.

Hydraulic System

The complete hydraulic system shall be contained inside an enclosure protecting it from corrosive elements and hydraulic freeze-up.

The two part system shall consist of an electric hydraulic power unit operating at 2500PSI and a separate electrically activated hydraulic valve block.

The atmospheric breather for the system shall be enclosed from the elements to avoid water ingress each time the system is activated.

All plow angling hydraulic cylinders shall have nitride coated rods to resist corrosion. Fluid level can be checked without tools.

Warranty

Snowplow shall have a two year parts and labor warranty against defects in material or workmanship.

Installation

The snow plow manufacturer is required to supply with each piece of equipment, a full set installation instruction detailing torque specifications for the mounting fasteners, hydraulic oil specifications for the plow hydraulic system and wiring schematics covering the plow headlights. The awarded vendor shall install snow plows per the manufacturer's instructions as supplied with bid. Bid price shall include all cost for installation and all vehicle modifications. The electronic controls for the plows must be wired thru a "key on hot" ignition source provided by the truck manufacturer. An electronic connection added to the truck's electrical system by the vendor is not acceptable.

Parts & Service

Manufacturer's franchised authorized dealer must have parts and service facility within four (4) hours of F.O.B. delivery location. The supplier of the front mounted snow plows is required to have a minimum of two (2) associates, who have completed certification training of the systems being provided, residing in the state of Tennessee. Each associate must have a minimum of four (4) years working experience in the snow plow equipment industry. They must also have completed certification training of the systems being provided to the state of Tennessee. The two associates will provide statewide training, and they shall also provide troubleshooting and warranty repairs for the snow plows currently being bid. **Failure to provide the associates located in Tennessee and Manufacturer Component Certification will be considered**

PLOW SPECIFICATIONS

3

failure to meet specifications. (Note: Manufacture certification as just an installer is not acceptable, troubleshooting, repairs, training capability and experience are required for all components that are in this bid specification). Franchised dealer address information must be attached to ITB and is a requirement for award. This must be a full service franchised dealership which includes; field representatives, manufacturer's required specialized tools, fully equipped service trucks, factory trained technicians. A list of three (3) satisfied customers using snow plows of the size and type bid and which have been installed and serviced by the manufacturer's franchised authorized service dealer listed below is required. List of customers must include franchise brand bid and model number of equipment.

Manuals

Manuals (printed or electronic) shall be provided with each unit and shall consist of complete electrical and hydraulic schematic drawings, replaceable parts list including brand names and part numbers of the snow plows and spreaders.

Acceptable Brands/Models: Boss Super Duty Straight Blade, Western Pro Plus or Equal

9' Front Mounted Snow Plow (Item ID 1000176370)

Moldboard

The blade shall be 9' wide and is a full moldboard trip blade design.

Blade moldboard shall be constructed from 11 gauge steel and includes standard cast iron wear shoes.

Cutting edge shall be Kuper GK-5 rubber edge with ceramic inserts or Joma 6000

Blade shall be 29" high with 7 vertical and 2 diagonal ribs. Blade measures 93 1/2" wide when angled at 30° and 96" when in the straight position.

Blade shall have a heavy duty push frame and quadrant which 1 1/2" X 10" hydraulic angle rams attach directly to.

The quadrant shall have built in angle ram stops. Blade shall include 4 fully adjustable trip springs and a shock absorber.

The blade and all attached parts shall have a baked-on powder coat finish with a zinc primer undercoating.

Note: Stainless steel or poly moldboard is not acceptable

Plow Attaching System

The plow shall have a hydraulically assisted attaching mechanism with an electrical toggle switch mounted on the headgear.

PLOW SPECIFICATIONS

4

The connecting pin spring levers can be properly positioned and shall engage automatically when toggle switch is energized, and headgear is raised by use of the hydraulic lift cylinder and hydraulic power unit.

The system shall also have a direct mounted 2" x 1½" x 10" lift ram with no lift chain or linkage or a two chain lift system.

The truck mounted push assembly shall be height adjustable to be properly adjusted to various vehicle ride heights.

Headlamp System

The plow headlamps shall have high and low beam capability. Halogen or L.E.D bulbs are acceptable. Front lenses with a built-in defrosting system to eliminate snow and ice build-up are required if bidding and L.E.D. bulb. System shall include cab mounted toggle switch to energize plow lights when plow is attached. Headlamp mounting mechanism shall include wraparound type hold down mount and tab style adjustment locking mechanism.

Lights meet SAE and FMVSS 108 specifications.

Electrical / Control System

Electrical system shall have two connectors at the vehicle grille.

Control harness shall have complete compatibility to operate either straight plows or Vee plows with no modifications to harness.

Electrical power for plow shall come directly from vehicle battery and shall have no effect on other vehicle systems.

Plow control options shall include a push button type handheld control or a joystick type control.

Handheld control shall have options that include the control being mounted to dash or the handle being removed for operators' preference.

Hydraulic System

The complete hydraulic system shall be contained inside an enclosure protecting it from corrosive elements and hydraulic freeze-up.

The two part system shall consist of an electric hydraulic power unit operating at 2500PSI and a separate electrically activated hydraulic valve block.

The atmospheric breather for the system shall be enclosed from the elements to avoid water ingress each time the system is activated.

All plow angling hydraulic cylinders shall have nitride coated rods to resist corrosion. Fluid level can be checked without tools.

Warranty

PLOW SPECIFICATIONS

5

Snowplow shall have a two year parts and labor warranty against defects in material or workmanship.

Installation

The snow plow manufacturer is required to supply with each piece of equipment, a full set installation instruction detailing torque specifications for the mounting fasteners, hydraulic oil specifications for the plow hydraulic system and wiring schematics covering the plow headlights. The awarded vendor shall install snow plows per the manufacturer's instructions as supplied with bid. Bid price shall include all cost for installation and all vehicle modifications. The electronic controls for the plows must be wired thru a "key on hot" ignition source provided by the truck manufacturer. An electronic connection added to the truck's electrical system by the vendor is not acceptable.

Parts & Service

Manufacturer's franchised authorized dealer must have parts and service facility within four (4) hours of F.O.B. delivery location. The supplier of the front mounted snow plows is required to have a minimum of two (2) associates, who have completed certification training of the systems being provided, residing in the state of Tennessee. Each associate must have a minimum of four (4) years working experience in the snow plow equipment industry. They must also have completed certification training of the systems being provided to the state of Tennessee. The two associates will provide statewide training, and they shall also provide troubleshooting and warranty repairs for the snow plows currently being bid. **Failure to provide the associates located in Tennessee and Manufacturer Component Certification will be considered failure to meet specifications. (Note: Manufacture certification as just an installer is not acceptable, troubleshooting, repairs, training capability and experience are required for all components that are in this bid specification).** Franchised dealer address information must be attached to ITB and is a requirement for award. This must be a full service franchised dealership which includes; field representatives, manufacturer's required specialized tools, fully equipped service trucks, factory trained technicians. A list of three (3) satisfied customers using snow plows of the size and type bid and which have been installed and serviced by the manufacturer's franchised authorized service dealer listed below is required. List of customers must include franchise brand bid and model number of equipment.

Manuals

Manuals (printed or electronic) shall be provided with each unit and shall consist of complete electrical and hydraulic schematic drawings, replaceable parts list including brand names and part numbers of the snow plows and spreaders.

Acceptable Brands/Models: Boss Super Duty Straight Blade, Western Pro Plus or Equal

PLOW SPECIFICATIONS

6

10' Front Mounted Snow Plow (Item ID 1000176371)

MOLDBOARD

The blade shall be 10' wide and is a full moldboard trip blade design.

Blade moldboard shall be constructed from 7 gauge steel and comes standard with a ½" X 6" and cast iron wear shoes.

Cutting edge shall be Kuper GK-5 rubber edge with ceramic inserts or Joma 6000.

Blade shall be 34 ½" high with 8 vertical and 2 diagonal ribs. Blade measures 104" wide when angled at 30° and 120" when in the straight position.

Blade shall have a heavy duty push frame and quadrant which 2" X 10" hydraulic angle rams.

The quadrant shall have built in angle ram stops.

Blade shall include 6 fully adjustable trip springs and 2 shock absorbers.

The moldboard has a baked-on powder-coat finish with zinc primer undercoating and all attached parts shall be powder coated.

Plow Attaching System

The plow shall have a hydraulically assisted attaching mechanism with an electrical toggle switch mounted on the headgear. The connecting pin spring levers can be properly positioned and shall engage automatically when toggle switch is energized, and headgear is raised by use of the hydraulic lift cylinder and hydraulic power unit. The system shall also have a direct mounted 2¼"x 1⅝"x 12" double acting lift ram with no lift chain or linkage or a two chain lift system. The truck mounted push assembly shall be height adjustable to be properly adjusted to various vehicle ride heights.

Headlamp System

The plow headlamps shall have high and low beam capability. Halogen or L.E.D. lamps are acceptable. Front lenses with a built-in defrosting system to eliminate snow and ice build-up are required when bidding and L.E.D. lamp. System shall include cab mounted toggle switch to energize plow lights when plow is attached. Headlamp mounting mechanism shall include wraparound type hold down mount and tab style adjustment locking mechanism.

Lights meet SAE and FMVSS 108 specifications.

Electrical / Control System

Electrical system shall have two connectors at the vehicle grille. Control harness shall have complete compatibility to operate any RT3 plow with no modifications to harness. Electrical power for plow shall come directly from vehicle battery and shall have no effect on other vehicle systems. The high torque electric motor shall have dual studs and draws 243 amps at 2000 psi. Plow control options shall include

PLOW SPECIFICATIONS

7

a push button type handheld control or a joystick type control. Handheld control shall have options that include illuminated buttons, express raise and lower features. The control may be mounted to dash or the handle may be removed for operators' preference.

Hydraulic System

The complete hydraulic system shall be contained inside an enclosure protecting it from corrosive elements and hydraulic freeze-up. The two-part system shall consist of an electric hydraulic power unit with a 3-quart reservoir operating at 2000 PSI and a separate electrically activated hydraulic valve block. The atmospheric breather for the system shall be enclosed from the elements to avoid moisture absorption each time the system is activated. All plow angling hydraulic cylinders shall have nitrate-coated rods to resist corrosion. Fluid level can be checked without tools.

Warranty

Snowplow shall have a two-year parts and flat rate labor warranty against defects in material or workmanship.

Installation

The snow plow manufacturer is required to supply with each piece of equipment, a full set installation instruction detailing torque specifications for the mounting fasteners, hydraulic oil specifications for the plow hydraulic system and wiring schematics covering the plow headlights. The awarded vendor shall install snow plows per the manufacturer's instructions as supplied with bid. Bid price shall include all cost for installation and all vehicle modifications. The electronic controls for the plows must be wired thru a "key on hot" ignition source provided by the truck manufacturer. An electronic connection added to the truck's electrical system by the vendor is not acceptable.

Parts & Service

Manufacturer's franchised authorized dealer must have parts and service facility within four (4) hours of F.O.B. delivery location. The supplier of the front mounted snow plows is required to have a minimum of two (2) associates, who have completed certification training of the systems being provided, residing in the state of Tennessee. Each associate must have a minimum of four (4) years working experience in the snow plow equipment industry. They must also have completed certification training of the systems being provided to the state of Tennessee. The two associates will provide statewide training, and they shall also provide troubleshooting and warranty repairs for the snow plows currently being bid. **Failure to provide the associates located in Tennessee and Manufacturer Component Certification will be considered failure to meet specifications. (Note: Manufacture certification as just an installer is not acceptable, troubleshooting, repairs, training capability and experience are required for all components that are in this bid specification).** Franchised dealer address information must be attached to ITB and is a requirement for award. This must be a full service franchised dealership which includes; field representatives, manufacturer's required specialized tools, fully equipped service trucks, factory trained technicians. A list of three (3) satisfied customers using snow plows of the size and type bid and which have been installed and serviced by the manufacturer's franchised authorized service dealer listed below is required. List of customers must include franchise brand bid and model number of equipment.

PLOW SPECIFICATIONS

Manuals

Manuals (printed or electronic) shall be provided with each unit and shall consist of complete electrical and hydraulic schematic drawings, replaceable parts list including brand names and part numbers of the snow plows and spreaders.

Acceptable Brands/Models: Boss Super Duty Straight Blade, Western Pro Plus or Equal

12' Front Mounted Snow Plow (Item ID: 1000114263)

General

Full trip rolled formed moldboard with power reverse by use of hydraulic cylinders 35 degrees left and right. Plow bid shall be a standard proven model of manufacturer's latest current production with additional features outlined in the following specifications. Unit shall be fully assembled and ready for installation.

Moldboard

Shall be 12' long and 30" high. Top edge shall have a full length integral snow shield. The front face of the moldboard is to be formed from a single sheet using 12 Ga. Ar-450 Hardox. The top half and snow shield is to have a minimum of 11" radius. The top edge of the moldboard is to extend a minimum of 17.5" forward of the cutting edge mounting angle. The radius from the cutting edge mounting angle to the top edge of the moldboard is to be a minimum of 24" overall. Top corners of the moldboard shall be tapered at a 45 degree angle. The outer vertical ribs shall be the cap for the moldboard cut out.

The rubber snow deflector shall be constructed of heavy duty reinforced rubber 10' long and 12" high and 3/8" thick. The deflector is to be bolted to the top moldboard reinforcing angle.

The moldboard front sheet shall be no less than 3 mm., AR-450 SSAB Hardox material and must be roll formed. Brake formed front sheet is not acceptable.

Moldboard shall have a 2" X 3" X 3/8" full length, one piece top angle.

Welding must be continuous to eliminate corrosion pockets.

Reinforcement shall be six (6) one piece ribs of 1/4" Domex XT-100 plate with 3" X 4" X 1/2" horizontal reinforcing angle full width of the moldboard. The horizontal brace angle shall be one piece design.

Segmented angles welded between the vertical ribs are not acceptable. The four center ribs shall include 1-1/4" X 3/8" wall tubular bushings to accept 1-1/4" push frame mounting pins.

PLOW SPECIFICATIONS

9

The plow moldboard shall have a double base angle. Lower moldboard reinforcing angle is to be welded to the blade rib braces and moldboard skin. Cutting edge mounting angle constructed from 4" X 4" X 3/4" structural angle shall be bolted to the lower moldboard angle. This design will allow the cutting edge angle to be replaced if damaged and does not require replacement of the entire moldboard.

The moldboard shall be designed to allow the cutting edge (described below) to be perpendicular to the road surface when the moldboard adjustment is set in the center pitch position (15 degrees).

Plow markers shall be included with the package. Markers shall be 48" tall 7/8" diameter and must include galvanized aircraft wire rope reinforcements crimped to the lower portion of the marker and inserted into the steel mounting bracket.

Cutting Edge System

Plow shall include one of the following cutting edge systems designed to fit a 12' moldboard with AASHO punching:

Kuper GK-5 low noise and abrasion – resistant rubber – corundum plow cutting edge or a winter equipment Joma 6000 articulating blade system.

12" AASHO punch for blade sections.

Three (3) four foot long sections are required.

Cutting Edge Reinforcement

The cutting edge mounting angle shall be reinforced using 1/2" thick gusset plates welded to the cutting edge angle the full length of the angle at 12" intervals.

Drive-Frame

Truss member shall be made from 3-1/2" X 3-1/2" X 1/2" rolled angle. A removable screw adjustable jack stand shall be included on the inside of the rolled angle in the center of this truss member. A storage lug shall be included with the jack stand in order to pin the jack leg to the upper portion of the moldboard when the plow is attached to the vehicle and is in the plowing mode.

A main drive-frame member shall be made from 4" X 4" X 3/8" structural tube.

Two (2) additional pieces of 3-1/2" X 3-1/2" X 1/2" angle shall be electrically welded perpendicular to the main drive angle connecting with the truss member to form a rigid structure.

Four (4) hinge points shall be provided for pinning the moldboard to the drive-frame, spanning 86-3/8" (on center).

Hinge points shall be double lugs constructed from 1/2" plate.

Four (4) 1-1/4" pins shall pin the moldboard to the drive-frame. The plow mounting pins shall have a minimum bearing surface of 12-1/2".

Reversible A-Frame

Pivot frame shall be fabricated from two (2) pieces of extra heavy duty 4" ship and car channel electrically welded to form a "V"

PLOW SPECIFICATIONS

10

The base or truck side of the A-frame shall have a 1" pivot plate welded continuously to the end of the A frame.

The center of the swivel plates shall be drilled to accept a 1-1/4" swivel bolt.

The A-frame shall be attached to a 4" X 4" X 3/8" tubular pivot beam with a 1-1/4" X 6-1/2" grade 8 bolt.

The front pivot point shall have a bushing and shall be drilled and tapped for grease fitting. Pivot bolt to be 1-1/4" grade 8.

Power reverse cylinders shall be a minimum of two (2) 3" X 9-1/4" heavy duty cylinders with induction hardened Nitrated rods.

Packing for these cylinders shall have minimum 3000 PSI operating pressure.

Ports for these cylinders shall have #8 S.A.E. male boss ratings.

Hoses shall be 3/8" diameter conforming to SAE 100R17 ratings and shall include 3/8" pioneer series 4050-39 or compatible quick disconnect fittings. One reversing hose shall have a female quick disconnect the second hose shall have the male side of the fitting so that the hoses can be coupled together when the plow is removed from the vehicle.

Plow manufacturer shall inspect our new truck hitch frame and locate hydraulic fittings so that they will not be damaged during operation.

Special note: The power reverse hoses must include a two port, slim body Multifaster connection with 3/8" body and 3/8" male O-ring face seal threads.

Trip Mechanism

Moldboard trip shall be designed with three compression spring trip assemblies.

Compression springs shall be a minimum of 5/8" diameter spring size with a minimum free length of 17"

Trip mechanism shall provide for three (3) spring tension adjustments providing a soft, medium and hard trip. Trip mechanism shall be set at medium trip upon delivery.

Push frame shall have three (3) compression trip arm mounting locations to provide the trip tension adjustments.

There shall be three (3) moldboard attachment positions to adjust the pitch of the moldboard to approximately 8 degrees, 15 degrees, or 22 degrees. Shall be set at 15 degrees upon delivery.

Tripping action of the plow shall allow for full rotation of the moldboard to the road surface (approximately 105 degrees) but be limited to 60 degrees rotation by the rubber bumpers and moldboard stops.

Lifting / Leveling Device

The plow is to be lifted by means of a single lift chain. The lift chain shall be constructed from a minimum of 3/8" proof coiled system 70 material and is to be attached to the plow push frame with a chain shackle on each side of the plow frame. The shackles shall be of proper capacity to carry the weight of the plow and must exceed the pull test weight of the chain. The lift chain shall be attached to the hitch lift arm to lift and allow the plow to lower into plowing position. Both the chain and the

PLOW SPECIFICATIONS

11

shackle tensile strength shall withstand the weight of the plow under bouncing conditions during travel on rough roads.

Plow lifting chain shall be capable of adjustment that permits the plow to be transported either full angled to the left or right side of the vehicle and remain level with the road surface. Plow leveling shall be accomplished by means of chains only; the addition of plates, slides, or rollers in order to level the plow is not acceptable.

NOTE: Cold shuts on any portion of the plow chain system shall not be acceptable.

Hitches / Swivel

Pin swivel shall be constructed from 4" ship and car channel with drive bars for 1-1/4" pin and shall accept plows with pin centers from 30" to 30.5".

Paint

All material shall be blasted to remove all mill scale, rust and contaminants.

Push frame parts shall be top coated black with polysiloxane direct to metal paint.

Moldboards shall be sand blasted and top coated with orange polysiloxane paint

Finished Weight

Plow shall be a minimum of 1,000 lbs. and a maximum of 1075 lbs.

Installation

The snow plow manufacturer is required to supply with each piece of equipment, a full set installation instruction detailing torque specifications for the mounting fasteners, hydraulic oil specifications for the plow hydraulic system and wiring schematics covering the plow headlights. The awarded vendor shall install snow plows per the manufacturer's instructions as supplied with bid. Bid price shall include all cost for installation and all vehicle modifications. The electronic controls for the plows and spreaders must be wired thru a "key on hot" ignition source provided by the truck manufacturer. An electronic connection added to the truck's electrical system by the vendor is not acceptable.

Parts & Service

Manufacturer's franchised authorized dealer must have parts and service facility within four (4) hours of F.O.B. delivery location. The supplier of the front mounted snow plow is required to have a minimum of two (2) associates, who have completed certification training of the systems being provided, residing in the state of Tennessee. Each associate must have a minimum of four (4) years working experience in the snow plow equipment industry. They must also have completed certification training of the systems being provided to the state of Tennessee. The two associates will provide statewide training, and they shall also provide troubleshooting and warranty repairs for the snow plows and spreader system currently being bid. **Failure to provide the associates located in Tennessee and Manufacturer Component Certification will be considered failure to meet specifications and will result in un-award of contract. (Note: Manufacture certification as just an installer is not acceptable, troubleshooting, repairs, training capability and experience are required for; ground speed controllers, hydraulic pumps, valves, and all hydraulic components that are in this bid document).** Franchised dealer address information must be attached to ITB and is a requirement for award. This must be a full service franchised dealership which includes; field representatives, manufacturer's required specialized tools, fully equipped service trucks,

PLOW SPECIFICATIONS

12

factory trained technicians. A list of three (3) satisfied customers using dump bodies of the size bid or larger with central hydraulic systems, controls and valves for hydraulically operating snowplow up/down, angle right/left, tailgate spreader on/off, hoist up/down including pump and hoses such as used by the same customers for snow removal which have been installed and serviced by the manufacturer's franchised authorized service dealer listed below is required. List of customers must include franchise brand bid and model number of equipment.

Manuals

Manuals (printed or electronic) shall be provided with each unit and shall consist of complete electrical and hydraulic schematic drawings, replaceable parts list including brand names and part numbers of the snow plows and spreaders.

Literature

Vendor shall provide engineer drawings and sketches in order to substantiate the plow meets all specifications in the bid.

Acceptable brands/models: VCM Model MW30R12-TN EXT CURL,
Craig Mfg. Model TT-0600-10 or Equal

14' Front Mounted Snow Plow (Item ID: 1000114259)

General

Full trip rolled formed moldboard with power reverse by use of hydraulic cylinders 35 degrees left and right. Plow bid shall be a standard proven model of manufacturer's latest current production with additional features outlined in the following specifications. Unit shall be fully assembled and ready for installation.

Moldboard

Shall be 14' long and 30" high. Top edge shall have a full length integral snow shield. The front face of the moldboard is to be formed from a single sheet using 12 Ga. Ar-450 Hardox. The top half and snow shield is to have a minimum of 11" radius. The top edge of the moldboard is to extend a minimum of 17.5" forward of the cutting edge mounting angle. The radius from the cutting edge mounting angle to the top edge of the moldboard is to be a minimum of 24" overall. Top corners of the moldboard shall be tapered at a 45 degree angle. The outer vertical ribs shall be the cap for the moldboard cut out.

The rubber snow deflector shall be constructed of heavy duty reinforced rubber 12' long and 12" high and 3/8" thick. The deflector is to be bolted to the top moldboard reinforcing angle.

The moldboard front sheet shall be no less than 3 mm., AR-450 SSAB Hardox material and must be roll formed. Brake formed front sheet is not acceptable.

Moldboard shall have a 2" X 3" X 3/8" full length, one piece top angle.

Welding must be continuous to eliminate corrosion pockets.

PLOW SPECIFICATIONS

13

Reinforcement shall be eight (8) one piece ribs of ¼" Domex XT-100 plate with 3" X 4" X ½" horizontal reinforcing angle full width of the moldboard. The horizontal brace angle shall be one piece design. Segmented angles welded between the vertical ribs are not acceptable. The four center ribs shall include 1-1/4" X 3/8" wall tubular bushings to accept 1-1/4" push frame mounting pins.

The plow moldboard shall have a double base angle. Lower moldboard reinforcing angle is to be welded to the blade rib braces and moldboard skin. Cutting edge mounting angle constructed from 4" X 4" X ¾" structural angle shall be bolted to the lower moldboard angle. This design will allow the cutting edge angle to be replaced if damaged and does not require replacement of the entire moldboard.

The moldboard shall be designed to allow the cutting edge (described below) to be perpendicular to the road surface when the moldboard adjustment is set in the center pitch position (15 degrees).

Plow markers shall be included with the package. Markers shall be 48" tall 7/8" diameter and must include galvanized aircraft wire rope reinforcements crimped to the lower portion of the marker and inserted into the steel mounting bracket.

Cutting Edge System

Plow shall include one of the following cutting edge systems designed to fit a 14' moldboard with AASHO punching:

Kuper GK-5 low noise and abrasion – resistant rubber – corundum plow cutting edge or a winter equipment Joma 6000 articulating blade system.

12" AASHO punch for blade sections.

Two (2) three foot sections and two (2) four foot long sections are required.

Cutting Edge Reinforcement

The cutting edge mounting angle shall be reinforced using ½" thick gusset plates welded to the cutting edge angle the full length of the angle at 12" intervals.

Drive-Frame

Truss member shall be made from 3-1/2" X 3-1/2" X ½" rolled angle. A removable screw adjustable jack stand shall be included on the inside of the rolled angle in the center of this truss member. A storage lug shall be included with the jack stand in order to pin the jack leg to the upper portion of the moldboard when the plow is attached to the vehicle and is in the plowing mode.

A main drive-frame member shall be made from 4" X 4" X 3/8" structural tube.

Two (2) additional pieces of 3-1/2" X 3-1/2" X ½" angle shall be electrically welded perpendicular to the main drive angle connecting with the truss member to form a rigid structure.

Four (4) hinge points shall be provided for pinning the moldboard to the drive-frame, spanning 86-3/8" (on center).

Hinge points shall be double lugs constructed from ½" plate.

Four (4) 1-1/4" pins shall pin the moldboard to the drive-frame. The plow mounting pins shall have a minimum bearing surface of 12-1/2".

PLOW SPECIFICATIONS

14

Reversible A-Frame

Pivot frame shall be fabricated from two (2) pieces of extra heavy duty 4" ship and car channel electrically welded to form a "V"

The base or truck side of the A-frame shall have a 1" pivot plate welded continuously to the end of the A frame.

The center of the swivel plates shall be drilled to accept a 1-1/4" swivel bolt.

The A-frame shall be attached to a 4" X 4" X 3/8" tubular pivot beam with a 1-1/4" X 6-1/2" grade 8 bolt.

The front pivot point shall have a bushing and shall be drilled and tapped for grease fitting. Pivot bolt to be 1-1/4" grade 8.

Power reverse cylinders shall be a minimum of two (2) 3" X 9-1/4" heavy duty cylinders with induction hardened Nitrided rods.

Packing for these cylinders shall have minimum 3000 PSI operating pressure.

Ports for these cylinders shall have #8 S.A.E. male boss threads.

Hoses shall be 3/8" diameter conforming to SAE 100R17 ratings and shall include 3/8" pioneer series 4050-39 or compatible quick disconnect fittings. One reversing hose shall have a female quick disconnect the second hose shall have the male side of the fitting so that the hoses can be coupled together when the plow is removed from the vehicle.

Plow manufacturer shall inspect our new truck hitch frame and locate hydraulic fittings so that they will not be damaged during operation.

Special note: The power reverse hoses must include a two port, slim body Multifaster connection with 3/8" body and 3/8" male O-ring face seal threads.

Trip Mechanism

Moldboard trip shall be designed with three compression spring trip assemblies.

Compression springs shall be a minimum of 5/8" diameter spring size with a minimum free length of 17"

Trip mechanism shall provide for three (3) spring tension adjustments providing a soft, medium and hard trip. Trip mechanism shall be set at medium trip upon delivery.

Push frame shall have three (3) compression trip arm mounting locations to provide the trip tension adjustments.

There shall be three (3) moldboard attachment positions to adjust the pitch of the moldboard to approximately 8 degrees, 15 degrees, or 22 degrees. Shall be set at 15 degrees upon delivery.

Tripping action of the plow shall allow for full rotation of the moldboard to the road surface (approximately 105 degrees) but be limited to 60 degrees rotation by the rubber bumpers and moldboard stops.

Lifting / Leveling Device

The plow is to be lifted by means of a single lift chain. The lift chain shall be constructed from a minimum of 3/8" proof coiled system 70 material and is to be attached to the plow push frame with a chain shackle on each side of the plow frame. The shackles shall be of proper capacity to carry the weight of the plow and must exceed the pull test weight of the chain. The lift chain shall be attached to

PLOW SPECIFICATIONS

15

the hitch lift arm to lift and allow the plow to lower into plowing position. Both the chain and the shackle tensile strength shall withstand the weight of the plow under bouncing conditions during travel on rough roads.

Plow lifting chain shall be capable of adjustment that permits the plow to be transported either full angled to the left or right side of the vehicle and remain level with the road surface. Plow leveling shall be accomplished by means of chains only; the addition of plates, slides, or rollers in order to level the plow is not acceptable.

NOTE: Cold shuts on any portion of the plow chain system shall not be acceptable.

Hitches / Swivel

Pin swivel shall be constructed from 4" ship and car channel with drive bars for 1-1/4" pin and shall accept plows with pin centers from 30" to 30.5".

Paint

All material shall be blasted to remove all mill scale, rust and contaminants.

Push frame parts shall be top coated black with polysiloxane direct to metal paint.

Moldboards shall be sand blasted and top coated with orange polysiloxane paint.

Finished Weight

Plow shall be a minimum of 1,200 lbs. and a maximum of 1290 lbs.

Installation

The snow plow manufacturer is required to supply with each piece of equipment, a full set installation instruction detailing torque specifications for the mounting fasteners, hydraulic oil specifications for the plow hydraulic system and wiring schematics covering the plow headlights. The awarded vendor shall install snow plows per the manufacturer's instructions as supplied with bid. Bid price shall include all cost for installation and all vehicle modifications. The electronic controls for the plows and spreaders must be wired thru a "key on hot" ignition source provided by the truck manufacturer. An electronic connection added to the truck's electrical system by the vendor is not acceptable.

Parts & Service

Manufacturer's franchised authorized dealer must have parts and service facility within four (4) hours of F.O.B. delivery location. The supplier of the front mounted snow plow is required to have a minimum of two (2) associates, who have completed certification training of the systems being provided, residing in the state of Tennessee. Each associate must have a minimum of four (4) years working experience in the snow plow equipment industry. They must also have completed certification training of the systems being provided to the state of Tennessee. The two associates will provide statewide training, and they shall also provide troubleshooting and warranty repairs for the snow plows and spreader system currently being bid. **Failure to provide the associates located in Tennessee and Manufacturer Component Certification will be considered failure to meet specifications and will result in un-award of contract. (Note: Manufacture certification as just an installer is not acceptable, troubleshooting, repairs, training capability and experience are required for; ground speed controllers, hydraulic pumps, valves, and all**

PLOW SPECIFICATIONS

16

hydraulic components that are in this bid document). Franchised dealer address information must be attached to ITB and is a requirement for award. This must be a full service franchised dealership which includes; field representatives, manufacturer's required specialized tools, fully equipped service trucks, factory trained technicians. A list of three (3) satisfied customers using dump bodies of the size bid or larger with central hydraulic systems, controls and valves for hydraulically operating snowplow up/down, angle right/left, tailgate spreader on/off, hoist up/down including pump and hoses such as used by the same customers for snow removal which have been installed and serviced by the manufacturer's franchised authorized service dealer listed below is required. List of customers must include franchise brand bid and model number of equipment.

Manuals

Manuals (printed or electronic) shall be provided with each unit and shall consist of complete electrical and hydraulic schematic drawings, replaceable parts list including brand names and part numbers of the snow plows and spreaders.

Literature

Vendor shall provide engineer drawings and sketches in order to substantiate the plow meets all specifications in the bid.

Acceptable brands/models: VCM Model MW30R14-TN EXT CURL,
Craig Mfg. Model TT-0600-10 or Equal